

# Fiscal Year 2008 Fact Book

## A Year in Review



National Institute of Allergy and Infectious Diseases



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
National Institutes of Health

## NIAID Mission

The mission of the National Institute of Allergy and Infectious Diseases is to conduct and support basic and applied research to better understand, treat, and ultimately prevent infectious, immunologic, and allergic diseases.

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Investigators from NIAID's Laboratory of Immunoregulation conduct studies of the human immune response to HIV.

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# Letter from the Director

The National Institute of Allergy and Infectious Diseases (NIAID) conducts and supports biomedical research—in intramural laboratories in Maryland and Montana, at institutions throughout the United States, and with international collaborators worldwide—to study the causes of infectious and immune-mediated diseases and to develop better means of preventing, diagnosing, and treating these illnesses. NIAID research improves the health of people in the United States and around the world.

This year's *NIAID Fact Book* summarizes the policies, programs, and mechanisms that enable the Institute to support research and training activities critical to advancing the NIAID mission. Among the Institute's infectious disease research priorities are global scourges such as human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), tuberculosis (TB), malaria, and other “tropical diseases”; emerging or re-emerging threats such as influenza, dengue, and methicillin-resistant *Staphylococcus aureus* (MRSA); and “deliberately emerging” threats posed by pathogens that could be used by bioterrorists. Among immune-related diseases, research priorities include autoimmune

diseases such as rheumatoid arthritis and type-1 diabetes, as well as asthma, allergies, and problems associated with transplantation.

Disease threats, especially those posed by infectious microbes, do not remain static, but change over time. New microbes emerge and familiar ones re-emerge with new properties (such as drug resistance) or in new settings. The burden of immune-mediated disease also can change, as we have seen with the marked increase in asthma cases in the United States. To accomplish our mission, the NIAID research program must respond quickly to new or changing disease challenges and take advantage of unprecedented scientific opportunities provided by advances in disciplines such as genomics and structural biology. NIAID long has recognized that solving the enormous global and domestic health problems requires a multi-faceted, multidisciplinary approach. The Institute works with academic, industrial, and international governmental and nongovernmental partners to tackle the global health disease burden. Increasingly, this research is conducted internationally; the fruits of that research benefit both the host countries and people in the United



States. For example, NIAID collaborates with researchers in many countries severely affected by the AIDS pandemic. Numerous promising HIV prevention and treatment approaches are being developed, tested, and refined in NIAID-supported HIV/AIDS clinical trials networks in the United States and abroad, as are interventions for many other infectious diseases.

Biodefense is another key Institute priority, and we are working to enhance our ability to respond effectively to both deliberate and naturally-occurring infectious disease threats. NIAID studies a wide range of pathogens that threaten public health, as well as the interactions of these agents—viruses, bacteria, fungi, parasites, and toxins—with the human host. Basic research findings inform the development of new and improved vaccines, therapeutics, and diagnostics that are essential to preventing or controlling public health crises.

Autoimmune diseases, allergic diseases, asthma, rejection of transplanted organs, and other immune-mediated disorders are significant causes of chronic disease and disability in the United States and throughout the world.

NIAID-supported research continues to illuminate our understanding of the mechanisms underlying immune-mediated diseases and the development of strategies to detect, prevent, and treat them.

**NIAID research improves the health of people in the United States and around the world.**

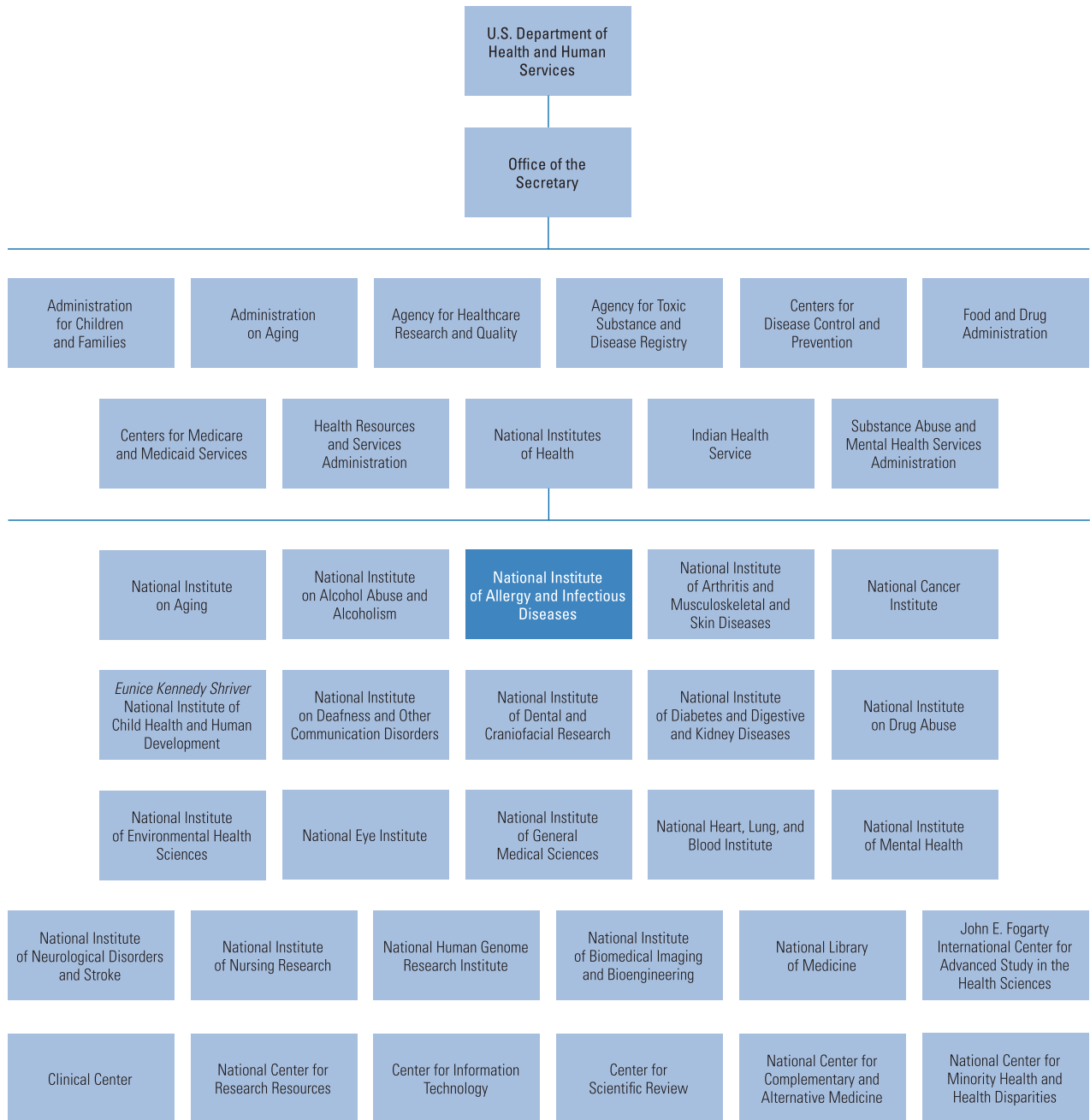
We still have much to discover about many infectious and immune-mediated diseases, and how best to diagnose, treat, and prevent them. However, with a strong research base, talented investigators in the United States and abroad, and the availability of powerful new research tools, our basic and applied research programs will continue to enhance our defenses against bioterrorism, to develop new tools in the fights against HIV/AIDS and other infectious diseases, and to improve therapies and management of immune-mediated diseases.

A handwritten signature in black ink, reading "A. Fauci, M.D." with a stylized flourish at the end.

Anthony S. Fauci, M.D.  
*Director*  
*National Institute of Allergy and Infectious Diseases*

# Organizational Overview

## U.S. Department of Health and Human Services and the National Institutes of Health





# National Institute of Allergy and Infectious Diseases



Additional information about NIAID's organizational structure can be found at:  
[http://www3.niaid.nih.gov/about/organization/org\\_charts](http://www3.niaid.nih.gov/about/organization/org_charts).

## NIAID Research and Science Management Framework

The National Institute of Allergy and Infectious Diseases (NIAID) is one of the 27 institutes and centers that comprise the National Institutes of Health (NIH), an agency of the Department of Health and Human Services (HHS). NIAID's mission is to conduct and support basic and applied research to better understand, treat, and ultimately prevent infectious, immunologic, and allergic diseases. Such research has led to therapies, vaccines, diagnostic tests, and other technologies that have improved the health of millions of people in the United States and around the world. Through its budget of approximately \$4.6 billion in Fiscal Year (FY) 2008, NIAID is funding research to advance its mission.

In recent years, the scope and complexity of NIAID's research portfolio have evolved in response to new challenges at home and abroad. These challenges include the threat of bioterrorism, the emergence and re-emergence of infectious diseases, and an increase in asthma and allergy prevalence among children. The biomedical research that NIAID supports to combat diseases of worldwide concern has taken on added importance in today's globalized society, and NIAID is at the forefront of efforts to address such global health research challenges. The strategic management of such a complex research agenda has two core components: (1) maintain a breadth and depth of knowledge in all areas of infectious, immunologic, and allergic diseases; and (2) develop flexible domestic and international capacities to respond appropriately to emerging and re-emerging threats wherever they may occur.

As with other large NIH institutes, most of NIAID's budget supports research at academic and research institutions outside of NIAID (referred to as extramural research) through grants, contracts, and cooperative agreements. NIAID directs and manages its extra-

mural research portfolio through the collective work of three divisions, whose titles reflect the scientific research areas highlighted in the Institute's mission statement: the Division of Acquired Immunodeficiency Syndrome (DAIDS), the Division of Microbiology and Infectious Diseases (DMID), and the Division of Allergy, Immunology, and Transplantation (DAIT). A fourth division, the Division of Extramural Activities (DEA), oversees policy and management activities related to funding grants and contracts, manages NIAID's research training, and conducts initial peer review for funding mechanisms with Institute-specific needs.

The remaining budget supports research within NIAID's own laboratories (called intramural research) as well as administrative functions of the Institute. NIAID's intramural research is conducted on the NIH campus in Bethesda, Maryland, and in nearby Rockville and Frederick. The Institute also has a large research campus in Hamilton, Montana, known as the Rocky Mountain Laboratories, and numerous international research collaborations, including those at sites in India, Mali, and Uganda through the International Centers of Excellence in Research program. The Institute's intramural research studies and clinical investigations are carried out through the Division of Intramural Research (DIR), the Division of Clinical Research (DCR), and the Vaccine Research Center (VRC). NIAID's Office of the Director (OD) provides Institute-level scientific and business leadership, direction, and assistance on budgetary, planning, evaluation, communication, workforce development, international, and initiative development activities.

Funding for NIAID is appropriated annually into three mission areas—Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome, Biodefense and Emerging Infectious Diseases,

and Infectious and Immunologic Diseases. These budgetary mission areas, of which HIV/AIDS and Biodefense are specified by Congress, cut across the Institute's organizational structure and provide support for more than 100 major research programs and initiatives.

- **Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS)**  
NIAID has a long-standing mandate to support research into the pathophysiology, prevention, and treatment of persons living with HIV/AIDS. Toward this end, NIAID has made considerable progress toward understanding the basic biology of HIV and its effect on the human immune system. This commitment to basic research has resulted in the development of antiviral medications and experimental vaccine candidates and other prevention interventions to combat this pandemic. HIV/AIDS funding also has provided support to the research community addressing the many consequences of living with HIV for many years, including opportunistic infections, liver disease, cardiovascular illnesses, metabolic disorders, and malignancies.

- **Biodefense (BioD) and Emerging Infectious Diseases**  
Natural emergencies or re-emergences of diseases such as severe acute respiratory syndrome (SARS) and avian influenza have occurred throughout history and will continue to occur as microbes evolve and

develop resistance to the methods used to control them. Such diseases have long been central to NIAID research efforts. In the past decade, however, world events highlighted the growing concern about bioterrorist threats, including the use of biological, chemical, and radiological weapons. Biodefense became an important element of NIAID's research mandate in 2003 when the Institute assumed the principal responsibility within HHS and NIH for research and development of medical countermeasures against terrorist threats of infectious disease and radiation.

### **The scope and complexity of NIAID's research portfolio have evolved in response to new challenges at home and abroad.**

Recognizing the potential deliberate use of emerging organisms, such as anthrax and smallpox, as biological weapons, and the fact that naturally occurring microbes can develop as new microbes and re-emerge with new properties—such as drug resistance—or in new settings, NIAID has integrated its biodefense research into the Institute's larger emerging and re-emerging infectious diseases portfolio. NIAID supports research to assess the mechanisms that lead these deliberately-occurring and naturally-emerging infectious agents to cause diseases as well as the ability of the immune system to combat them. NIAID's research efforts are a key component of the larger national biodefense research agenda.



(far left) A nurse administers an intramuscular vaccination to young girl. (left) Investigator at South Korea's National Masan Tuberculosis Hospital.

## ■ Infectious and Immunologic Diseases (IID)

NIAID's efforts to create vaccines, drugs, and diagnostic tools depend on a firm foundation of basic research on the biological properties of pathogens and the mechanisms the immune system uses to defeat them. Despite advances in medicine and public health interventions, infectious diseases still account for one-quarter of all deaths worldwide. NIAID research focuses on nearly 300 microorganisms, including bacteria (such as *Escherichia coli* and *Staphylococcus aureus*), viruses (such as *hepatitis C* and West Nile), parasites (such as *Plasmodium* and *Schistosoma*), fungi (such as *Aspergillus* and *Histoplasma*), and prions. NIAID research also examines how aberrant responses of the immune system play a critical role in the development of immune-mediated disorders, such as asthma, allergies, autoimmunity, and transplant rejection. Research on these diseases and disorders is allowing us to understand more fully how the immune system functions normally and in disease processes—knowledge that is laying the groundwork for the development of new interventions for immune-mediated diseases.

## Research Planning Process

Research planning and priority setting at NIAID is a continuous, dynamic process. This process provides a solid framework for building a diverse research portfolio of high-quality research that advances NIAID's mission, while affording the flexibility needed to both pursue unanticipated scientific opportunities and respond to emerging public health concerns. This long-standing process combines NIAID's semi-annual Institute-wide planning meetings with a rigorous process for developing and prioritizing specific research initiatives. Throughout the planning process, NIAID routinely consults with its stakeholders, including scientific experts, members of scientific societies and patient advocacy organizations, gathering their input and guidance in shaping the Institute's new and continuing research programs.

Each year, NIAID convenes two annual planning events: the Winter Program Review (WPR) and the Summer Policy Retreat (SPR). The WPR brings NIAID scientific directors and senior administrators together to focus on and review ongoing programs and research activities planned for the future budget year, and consider them in terms of long-range research priorities and opportunities. The SPR is a forum that allows NIAID senior leadership to discuss broad scientific issues and policies with implications for the Institute's mission.

Planning for specific research initiatives begins two to three years before a funding opportunity announcement is released to the research community. Internal processes span this time period, allowing for extensive review and consideration of the planned initiatives alongside the Institute's priorities. In addition, a number of internal forums exist that allow Institute leadership to strategize and determine how best to invest NIAID's available funds. Initiative concepts undergo a second level review and approval by the National Advisory Allergy and Infectious Diseases Council.

Research planning around specific diseases and science areas results in action plans, research agendas, and reports. In FY 2008, NIAID updated its strategic plan and published "*NIAID: Planning for the 21st Century, 2008 Update*." The updated plan describes broad-based, Institute-wide priorities that guide NIAID's programs, policies, and initiatives. In FY 2008, NIAID also published its "*Strategic Plan for Malaria Research*," and the related "*NIAID Research Agenda for Malaria*."

For links to NIAID's strategic plans and research agendas, visit <http://www3.niaid.nih.gov/about/whoWeAre/planningpriorities>.

# NIAID—A Year in Review

NIAID received \$4.6 billion in FY 2008, a period that spanned October 1, 2007 to September 30, 2008. The appropriation enabled continuing research efforts to better understand, identify, treat, and ultimately prevent infectious, immunologic, and allergic diseases and to develop new therapies, vaccines, and diagnostic tests. NIAID's primary commitment is to scientific studies proposed by researchers (considered investigator-initiated or unsolicited research) who work in universities, medical schools, and other research institutions across the United States and abroad, with an appropriate balance for NIAID research areas identified as high priority by NIAID.

The *Fact Book* summarizes how FY 2008 funding was distributed among NIAID research programs and funding mechanisms, provides comparisons with prior year allocations, and outlines the funding policies influencing grant awards. In addition, this report provides examples of significant programmatic and scientific accomplishments advanced by the FY 2008 NIAID appropriation.



This publication provides a glimpse of the exciting scientific research conducted and supported by NIAID.

## Budget Highlights

- NIAID received \$4.6 billion in appropriated funds, an increase of \$166 million or 3.6 percent over FY 2007.
- NIAID distributed funds similarly across the three mission areas: BioD and Emerging Infectious Diseases, 35 percent; HIV/AIDS, 32.7 percent; and IID, 32.3 percent.
- Approximately 84 percent of the total NIAID budget was awarded to the extramural research community. This includes 52 percent to Research Project Grants (RPGs), 26 percent to Research and Development (R&D) contracts, and 6 percent to research centers, training, and other research.
- NIAID increased funding for RPGs by nearly \$39 million over FY 2007, allowing the Institute to fund a total of 4,377 RPGs in FY 2008.
- The adjusted average cost per competing RPG increased from \$371,000 in FY 2007 to \$400,000 in FY 2008.
- Approximately 26 percent of competing R01 awards were made to new investigators, defined as a principal investigators (PIs) who have not previously competed successfully as a PI for a significant NIH independent research award.
- NIAID was able to maintain a nearly 23 percent success rate for competing RPG applications, a rate slightly higher than the overall NIH success rate of approximately 22 percent.
- Approximately 70 percent of the NIAID total budget supported domestic institutions in the United States, including the District of Columbia and Puerto Rico.
- The Institute's intramural research program comprised 11.5 percent of the total NIAID budget.
- NIAID supported 683 international projects in 90 countries, totaling approximately \$418 million.



## Financial Management Plan

*Pursuant to NIH budget policy:*

- **Renewal Grants:** Capped at 20 percent—applicants could request up to 20 percent more than the level of the previous grant.
- **Noncompeting Nonmodular Awards:** All years funded at 98 percent of the amount in the Notice of Grant Award for the previous year.
- **Competing Applications:** No average programmatic reductions were taken.

*Traditionally, NIAID sets aside funds for selective pay and Bridge awards:*

- **Selective pay:** NIAID set aside \$9 million (\$3 million for each extramural program division). Note: Investigators could not apply for selective pay funding, but had to be nominated by NIAID program officers.
- **R56-Bridge awards:** NIAID set aside \$18 million (\$6 million for each extramural division). Note: Investigators could not apply for R56-Bridge awards, but rather had to be nominated by NIAID program officers.

## Program Highlights

In FY 2008, NIAID released 31 funding initiatives to spur scientific interest in selected areas that align with the Institute's research programs and priorities. Examples of these initiatives and other large programmatic activities, such as notable scientific meetings sponsored by the Institute are highlighted below.

- In March 2008, NIAID sponsored the Summit on HIV Vaccine Research and Development, which resulted in a consensus to increase emphasis on basic HIV vaccine research. Toward this end, NIAID launched two new initiatives. The *Highly Innovative Tactics to Interrupt Transmission of HIV* program invited novel, unconventional, “outside the box” applications to identify and develop drug targets and new approaches to prevent HIV transmission. The *Basic HIV Vaccine Discovery Research* initiative encouraged applications to generate new knowledge that will inform new conceptual approaches to HIV vaccine design.
- Through the *B Cell Immunology for Protective HIV-1 Vaccine* program, NIAID funded new research to foster fundamental research on B cell immunology to derive new understanding and approaches for development of HIV vaccines.
- NIAID launched the initiative, *Partnership for Point of Care (POC) Diagnostic Technologies for Nontraditional Health Care Settings*, to advance the development of diagnostic tools for use in a home, clinic, and other nontraditional healthcare setting to identify infectious diseases and toxins causing sexually transmitted diseases, urinary tract infections, and respiratory infections.



NIAID strives to optimize resources to maximize scientific opportunity.

- NIAID released the *Novel HIV Therapies: Integrated Preclinical/Clinical Program* initiative to foster preclinical studies aimed at discovering and developing new HIV therapeutics through collaborations between NIAID, academia, and the private sector. The goal of this initiative is to move new, safe, and effective HIV therapeutics and topical microbicides from the laboratory to the clinic.
- NIAID continued its support of the two largest observational studies of HIV/AIDS in women—*Women’s Interagency HIV Study (WIHS)*—and homosexual or bisexual men—*Multi-Center AIDS Cohort Study (MACS)*—in the United States. This year, the WIHS and MACS completed their 15th and 25th year of research, respectively. These domestic cohorts are on the forefront of research to define the clinical manifestations of long-term HIV/AIDS and have repeatedly made major contributions toward understanding HIV spread, disease progression, best treatment, and cardiovascular disease risk in long-term HIV/AIDS. These studies also are exploring aging, sleep disorders, frailty, renal function, behavior, and neurocognitive function in HIV-infected persons.
- NIAID continued to support the *Southeast Asia Infectious Disease Clinical Research Network*, a program focused on advancing knowledge and clinical management of influenza caused by avian and human viruses by bringing together hospitals and institutions in Indonesia, Singapore, Thailand, the United Kingdom, the United States, and Vietnam.
- NIAID continued its support of the *International Centers for Excellence in Research (ICER)* program by funding the completion of the Rakai Health Sciences Program Kalisizo laboratory and clinical center infrastructure in Uganda. The ICER program was created to develop and sustain research programs in resource-poor countries through partnerships with local scientists in Mali, Uganda, and India.
- NIAID joined with two advocacy groups, the Food Allergy and Anaphylaxis Network and the Food Allergy Project, to fund innovative studies of food allergy through the *Exploratory Investigations in Food Allergy* program.
- NIAID invited institutions to submit new and renewal applications to participate in the *Clinical Trials in Organ Transplantation* consortium, a cooperative investigative group that conducts multi-site clinical trials with recipients of thoracic and abdominal organ transplants. The goal of this research effort is to improve the long-term outcome of transplant recipients.
- In 2008, the *NIAID Mobile Vaccine Unit* was launched in Washington, DC and Maryland to increase community awareness of HIV/AIDS vaccine research and facilitate the enrollment of healthy adults in vaccine studies. Participation of volunteers, scientists, community members, and health professionals in HIV vaccine research is an important component of NIAID’s comprehensive HIV prevention research effort.



NIAID’s Vaccine Mobile Unit facilitates the enrollment of healthy adults in HIV vaccine studies.

- To address growing concerns about bioterrorism and emerging infectious diseases, NIAID expanded research programs to facilitate the development of vaccines, therapeutics, and medical diagnostics focused on select high-priority pathogens and toxins through the *Cooperative Research Partnerships for Biodefense* and the *Regional Centers of Excellence for Biodefense and Emerging Infectious Diseases Research*.
- NIAID established the *Integrated Research Facility* on the grounds of Fort Detrick in Maryland to provide a facility for conducting research aimed at pre-empting the public health impact of highly infectious agents that could arise naturally or be used as potential biological weapons.
- NIAID continued its long-standing support of the *Asthma and Allergic Diseases Cooperative Research Centers* by continuing to fund 15 centers located throughout the United States. These centers have been responsible for many important basic science discoveries and clinical advances, including studies focused on understanding how changes in the immune system lead to the development and worsening of asthma and how these changes are influenced by infections, pollution, environmental allergens, and genetics.
- Through the *Infectious Disease Clinical Research Program (IDCRP)*, a collaboration between NIAID and the Department of Defense (DoD) focused on militarily relevant clinical infectious disease research, NIAID is continuing support of a retrospective and prospective observational study of the natural history of HIV infection in active duty U.S. military personnel in the DoD. With more than 4,900 subjects enrolled—of which more than 50 percent are documented seroconverters (defined as having a positive HIV test following a documented, negative HIV test)—this cohort is recognized as a “national resource.” IDCRP investigators also are collaborating with a number of other federal investigators on cutting-edge HIV research.
- NIAID launched the *Immune Mechanisms of Virus Control Program*, inviting applications to establish a network of synergistic research teams focused on understanding the mechanisms involved in the natural control of viral infection, vaccination, and protective immunity.
- *The Collaborative Antiviral Testing Group* continued to evaluate the toxicology, efficacy, and drug delivery methods for compounds against influenza, pox viruses, SARS, and other NIAID Category A, B, and C viruses.
- NIAID released an initiative to continue support of *Sexually Transmitted Infection (STIs) Cooperative Research Centers* to discover new ways to prevent, diagnose, and treat STIs by inviting collaborative multidisciplinary applications in biomedical, clinical, behavioral, and product development research.
- NIAID supported 225 clinical trials to develop better diagnostics, vaccines, and therapeutics for infectious and immune-mediated diseases and conditions, such as asthma, kidney transplantation, influenza, and HIV/AIDS.



A child in the Children's National Medical Center asthma clinic, site of an NIAID-supported asthma study.

## Assessing Research Progress

Assessing research progress is an integral part of NIAID's role in ensuring that the Nation's investment in infectious, immunologic, and allergic disease research generates valuable knowledge and results in new technologies and applications that improve health. Peer review of new and renewal grant applications and contract proposals is one of the most important means by which NIAID assesses research progress and performance.

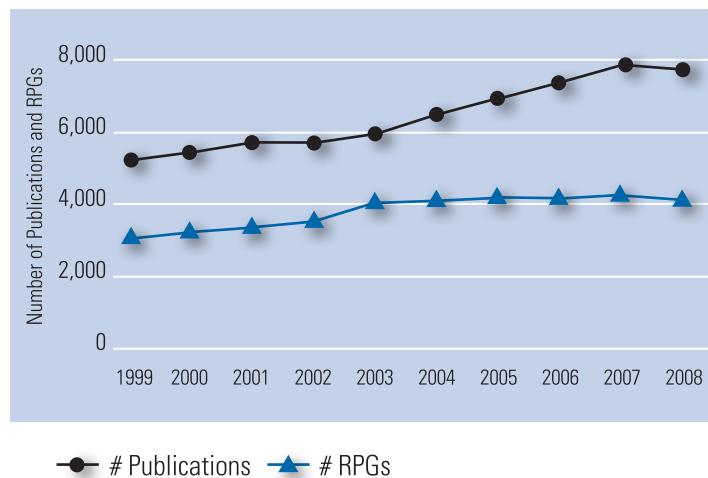
NIAID assesses research progress in other ways as well. Analyses of the number of grants funded and dollars invested in a given scientific field shed light on the Institute's performance. Examples of these analyses are listed in the *Budget Highlights* section and throughout the *Fact Book*. NIAID convenes scientific workshops, program reviews, and blue ribbon panels to provide objective expertise on research progress and the Institute's future research agenda in specific scientific areas. Often, the recommendations from these outside panels result in new scientific priorities, initiatives, and funding announcements. Examples of these activities are listed in the *Program Highlights* section.

Analyses of the number of scientific publications and patents can be used to evaluate the short- and long-term performance of research. Such measures—which are considered “outcome” measures—reflect the productivity, quality, and impact of research projects; progress in a research field; and NIAID performance.

Selected outcome measures resulting from NIAID supported research:

- Approximately 7,800 articles referencing NIAID funding were published in scientific peer-reviewed journals in FY 2008.
  - On average, each NIAID-funded RPG produced 1.9 articles in FY 2008.
  - Of the projects that started within the last two years (FY 2007 and FY 2008), 18 percent produced articles in FY 2008.
  - Of the projects that started more than two years ago (FY 2006 and earlier), 59 percent of the projects produced articles in FY 2008.
- During FY 2008, 46 patents were issued citing FY 2008 extramural NIAID-supported research projects.
- During the last ten years, NIAID-funded projects produced an average of 1.7 articles per RPG per year.

### Scientific Publications Acknowledging NIAID Funding: FY 1999 – FY 2008





Scientific advances, which are reported through articles in scientific journals, at conferences and in print, broadcast, and on-line media venues, offer yet other ways to assess scientific progress. Selected scientific accomplishments resulting from NIAID-supported research published in scientific peer-reviewed journals during FY 2008 are listed below.

- **Male Circumcision Reduces Risk for Acquiring HIV:** NIAID-supported international studies provide overwhelming evidence that medically supervised circumcision can reduce a man's risk of acquiring HIV through heterosexual intercourse. A study in Kenya of 2,784 HIV-negative men showed a 53 percent reduction in HIV acquisition among circumcised participants compared to those who were uncircumcised. In addition, a second study of nearly 5,000 HIV-negative men in Uganda demonstrated a 48 percent reduction in HIV acquisition among circumcised men. In response to the results of these studies and an earlier trial conducted in South Africa, the World Health Organization recommended that male circumcision be recognized as an additional important intervention to reduce the risk of heterosexually acquired HIV infection in men.

R Gray *et al.* Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial. *Lancet* 369: 657-66 (2007). R Bailey *et al.* Male circumcision for HIV Prevention in young men in Kisumu, Kenya: a randomized controlled trial. *Lancet* 369:643-56 (2007).

- **Mother-To-Child Transmission (MTCT) of HIV by Breastfeeding Reduced with Daily Drug Therapy:** Results from an NIAID-sponsored clinical trial demonstrated that infants who are breast-fed by their HIV-positive mothers are less likely to contract HIV if treated daily with the anti-HIV drug, nevirapine. Newborns were given the drug on the eighth day of life and everyday thereafter for six weeks to prevent infection while breastfeeding from their HIV-positive

mothers. The combined rates of HIV infection and death in those newborns were significantly lower than those receiving the standard, single dose of the drug after birth. The trials revealed that an extended course of daily nevirapine was as safe as the current standard of care to prevent MTCT. Based on these findings, NIAID modified the design of similar studies planned for South Africa and Tanzania to include administration of nevirapine for the first six months of life in infants born to HIV-positive mothers.

SWEN Study Team *et al.* Extended-dose nevirapine to 6 weeks of age for infants to prevent HIV transmission via breastfeeding in Ethiopia, India, and Uganda: an analysis of three randomised controlled trials. *Lancet* 372:300-13 (2008).

- **Receptor Found to be used by HIV to Infect Cells:** A newly discovered cellular receptor may help scientists understand how HIV is able to infect T cells, a type of immune cell. NIAID scientists demonstrated that the molecule  $\alpha 4/\beta 7$ , which normally functions as a "homing" molecule to direct T cells to the gut, also serves as a receptor for HIV.

### GPRA REPORTING

NIAID participates in the NIH performance measure reporting activity mandated by the Government Performance and Results Act (GPRA), which was passed in 1993. Federal agencies identify, measure, and report on specific GPRA measures annually. In FY 2008, NIH reported on more than 75 measures that represent a cross-section of important NIH research. NIAID contributed to 12 measures and led NIH reporting in measuring progress in:

- Islet transplantation for treatment of type 1 diabetes
- Evaluation of an HIV vaccine candidate
- Studies determining the impact of therapies used to control sexually transmitted infections and their role as a co-factor in HIV acquisition, and
- Developing a universal antibiotic effective against multiple classes of biological pathogens.



Understanding the interactions between HIV and  $\alpha 4/\beta 7$  could have important implications for preventing HIV infection. Existing drug candidates targeting  $\alpha 4/\beta 7$ , which have been used to treat autoimmune disorders, could also be explored as potential anti-HIV treatments.

J Arthos *et al.* HIV-1 envelope protein binds to and signals through integrin  $\alpha 4/\beta 7$ , the gut mucosal homing receptor for peripheral T cells. *Nat Immunol* 9:301-9 (2008).

- ***Staphylococcus aureus* Escapes the Immune System by Producing a Specific Enzyme:** *Staphylococcus aureus*, one of the most invasive and virulent pathogens to infect humans, has an extraordinary ability to escape attack by the immune system. In addition to its well-known ability to mutate into drug-resistant forms, *S. aureus* also can resist attacks by nitric oxide (NO), a first-line strategy used by the immune system to kill invading pathogens. An NIAID study found that *S. aureus* resists typically protective levels of NO by producing an enzyme called lactate dehydrogenase (LDH). This enzyme negates the local toxicity of NO and allows *S. aureus* to thrive in what otherwise would be a life-threatening environment. This finding shows how LDH can help bacteria evade host defenses making it a potential new target for future drug development.

A Richardson *et al.* A nitric oxide-inducible lactate dehydrogenase enables *Staphylococcus aureus* to resist innate immunity. *Science* 319:1672-6 (2008).

- **Decoding the Genome of the Parasite Causing Relapsing Malaria:** *Plasmodium vivax* is the leading cause of relapsing malaria in humans and the most common malaria parasite outside of Africa. Research into the biology of *P. vivax* lags far behind that of the more lethal malaria parasite, *Plasmodium falciparum*; *P. vivax* cannot easily be grown in the laboratory and genetic tools have not been available. Now, NIAID-funded researchers have sequenced the *P. vivax* genome. Genomic analysis revealed that

*P. vivax* shares many genes and metabolic pathways with *P. falciparum*. The parasite also contains previously unknown genes that may help it enter red blood cells. This discovery will allow in-depth analysis of the mechanisms involved in malaria pathogenesis, relapse, drug resistance, and vaccine development.

J Carlton *et al.* Comparative genomics of the neglected human malaria parasite *Plasmodium vivax*. *Nature* 455: 757-63 (2008).

- **Improving Long-Term Kidney Transplant Survival without Immunosuppressive Drugs:** The drugs that prevent the body from rejecting donor organs are highly toxic and require adherence to a life-long regimen that suppresses the entire immune system. NIAID-supported researchers developed a regimen to reduce or even prevent kidney rejection without continued use of immunosuppressive drugs. The regimen involved the transplantation of bone marrow and a kidney from the same donor. Researchers found four of the five patients who received the immunosuppressive therapy before and after



*Anopheles minimus*, the mosquito responsible for spreading the malaria parasite.

kidney transplant could discontinue use of the drugs after 9–14 months without organ rejection. These early results offer hope to improve the quality of life and lifespan of transplant recipients.

T Kawai *et al.* HLA-mismatched renal transplantation without maintenance immunosuppression. *N Engl J Med* 358:353-61 (2008).

- **New Method to Rapidly Generate Antibodies Against Influenza:** NIAID-supported investigators developed a new method to rapidly generate strong and robust influenza-specific antibodies from volunteers who have been vaccinated against influenza. The method allows identification of cells that secrete an antibody that can neutralize the virus within a month of vaccination. The antibody-producing cells could be grown in a laboratory to generate large amounts of highly specific and potent antibodies for use as diagnostics or as therapeutic agents. The method has potential to be used for many pathogens in addition to influenza.

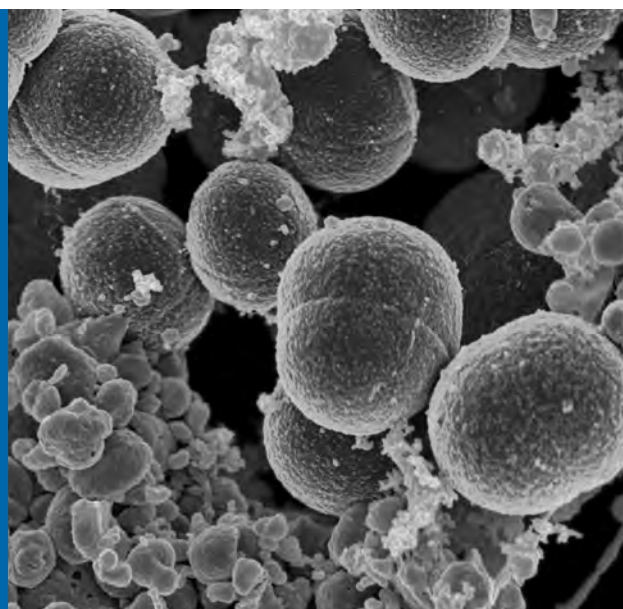
J Wrammert *et al.* Rapid cloning of high-affinity human monoclonal antibodies against influenza virus. *Nature* 453:667-71 (2008).

- **Altered Immune Responses in the Elderly Contribute to West Nile Virus Disease:** This study showed that macrophages—immune cells involved in the early defense against pathogens—from elderly patients have impaired responses when exposed to West Nile virus compared to responses in younger people. Of note, macrophages from elderly patients expressed many characteristic inflammatory molecules (cytokines and Toll-like receptors) when responding to the virus. These inflammatory molecules may make the natural blood-brain barrier more permeable. This finding points to mechanisms that may explain the high level of West Nile virus-associated encephalitis in the elderly and help scientists identify potential drug targets to diminish severity of the disease.

K Kong *et al.* Dysregulation of TLR3 impairs the innate immune response to West Nile virus in the elderly. *J Virol* 82:7613-23 (2008).

- **Discovery of the Potential Cause of Hyper-IgE Syndrome:** HIES, also called Job's syndrome, is a rare disorder of the immune system characterized by recurrent and often severe bacterial and fungal infections leading to dermatitis, boils, and bone abnormalities. NIAID investigators revealed that HIES may arise from mutations in an immune gene called the signal transducer and activator of transcription-3 (*STAT3*), which helps alert and direct immune system responses to stop invading pathogens. This finding will promote early diagnosis of HIES and inform the search for genetic causes of diseases with similar features.

J Milner *et al.* Impaired T<sub>H</sub>17 cell differentiation in subjects with autosomal dominant hyper-IgE syndrome. *Nature* 452:773-6 (2008).



Methicillin-resistant *Staphylococcus aureus* (MRSA), bacteria that are resistant to many forms of antibiotics, surrounded by dead white cell. MRSA studies are underway in the Laboratory of Human Bacterial Pathogenesis at NIAID's Rocky Mountain Laboratories.

# NIAID Appropriations History

## NIAID Appropriations History: FY 1999 – FY 2008

### Funding

Dollars in Thousands

Fiscal Year	President's Budget to Congress	Appropriation <sup>1</sup>
1999	\$ 703,723 <sup>2</sup>	\$ 1,569,063
2000	789,156 <sup>2</sup>	1,798,038
2001	935,166 <sup>2</sup>	2,068,304
2002	2,355,325	2,534,539
2003	3,983,693 <sup>3</sup>	3,706,722 <sup>4</sup>
2004	4,335,255 <sup>5</sup>	4,304,562 <sup>6</sup>
2005	4,440,007 <sup>3</sup>	4,402,841 <sup>4</sup>
2006	4,459,395 <sup>3</sup>	4,414,801 <sup>4</sup>
2007	4,395,496 <sup>3</sup>	4,417,208 <sup>4</sup>
2008	4,592,482 <sup>7</sup>	4,583,344 <sup>8</sup>

<sup>1</sup> Reflects enacted supplementals, rescissions, and reappropriations.

<sup>2</sup> Excludes funds for HIV/AIDS research activities consolidated in the NIH Office of AIDS Research.

<sup>3</sup> Includes \$100M for the Global Fund to Fight AIDS, Tuberculosis and Malaria.

<sup>4</sup> Includes \$99M for the Global Fund to Fight AIDS, Tuberculosis and Malaria.

<sup>5</sup> Includes \$150M for the Global Fund to Fight AIDS, Tuberculosis and Malaria.

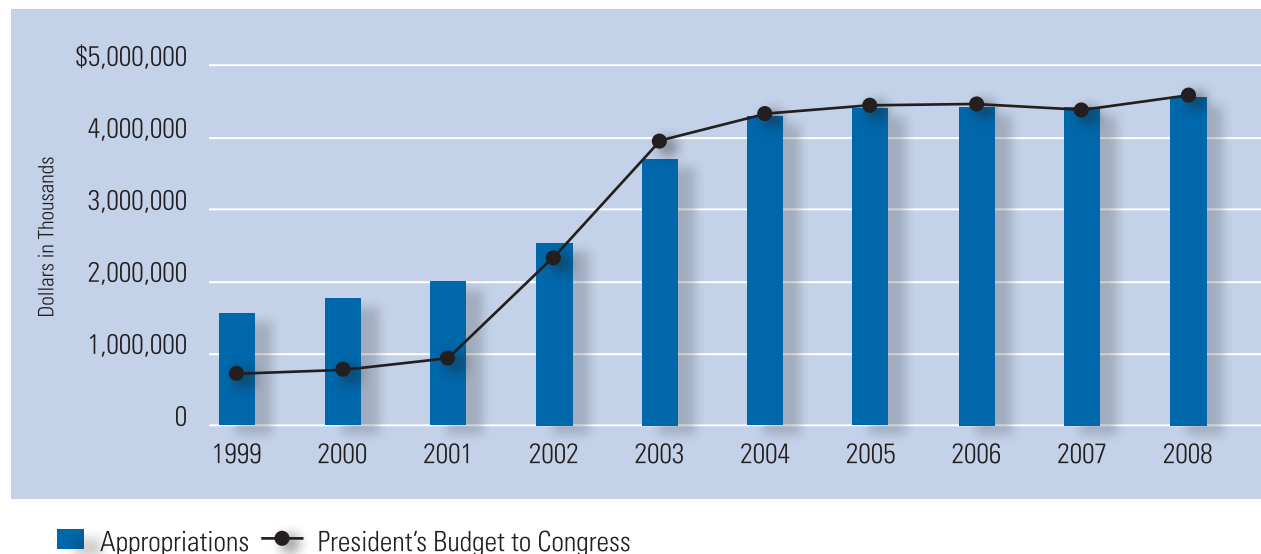
<sup>6</sup> Includes \$149M for the Global Fund to Fight AIDS, Tuberculosis and Malaria.

<sup>7</sup> Includes \$300M for the Global Fund to Fight AIDS, Tuberculosis and Malaria.

<sup>8</sup> Includes \$295M for the Global Fund to Fight AIDS, Tuberculosis and Malaria.

## NIAID Appropriations History: FY 1999 – FY 2008

### Funding



## NIAID Mission Areas

Funding for NIAID falls into three mission areas:

- Biodefense and Emerging Infectious Diseases (BioD)
- HIV/AIDS
- Infectious and Immunologic Diseases (IID)

### NIAID Mission Areas: FY 2002 – FY 2008

#### Funding

Dollars in Thousands

Fiscal Year	BioD	HIV/AIDS	IID	Total <sup>1</sup>
2002	\$ —	\$1,186,494	\$1,178,285	\$2,364,779
2003 <sup>2</sup>	1,162,267	1,311,274	1,232,598	3,706,139
2004 <sup>2,3</sup>	1,599,896	1,397,370	1,307,890	4,305,156
2005 <sup>2,3</sup>	1,658,211	1,459,642	1,284,988	4,402,841
2006 <sup>2,3</sup>	1,646,702	1,488,377	1,276,689	4,411,768
2007 <sup>2</sup>	1,596,565	1,490,089	1,276,380	4,363,034
2008 <sup>2</sup>	1,602,353	1,497,722	1,481,135	4,581,210

Reflects actual obligations

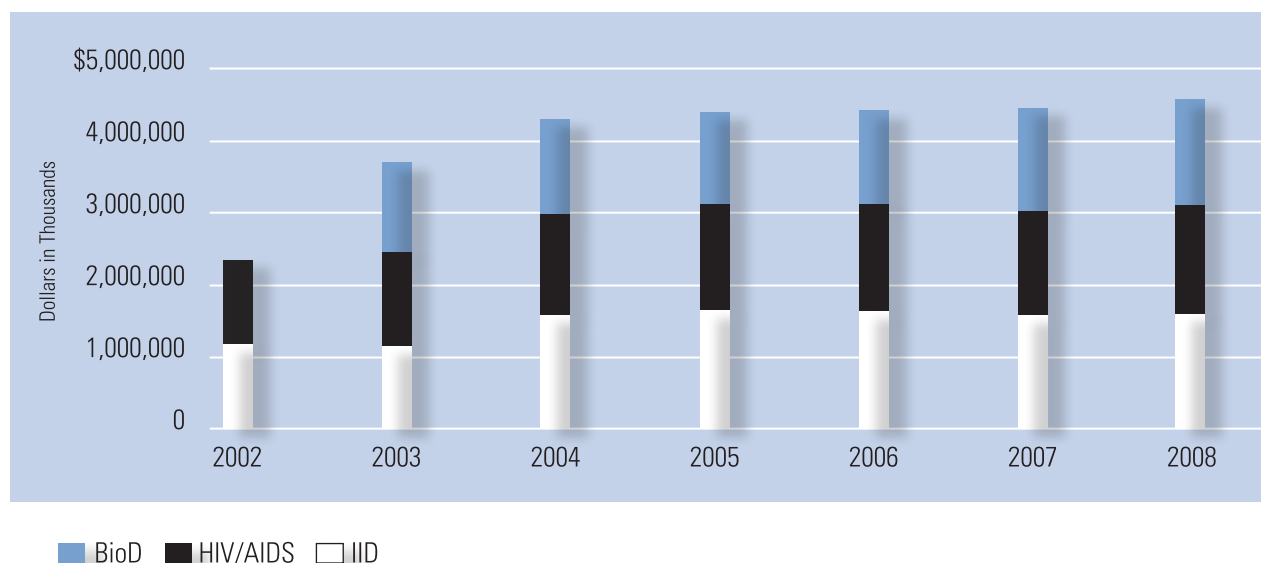
<sup>1</sup> NIAID totals listed in the NIAID Mission Area table differ from the Fiscal Year Appropriations in the table on the previous page due to enacted supplements, rescission, and reappropriations.

<sup>2</sup> Includes Global Fund to Fight AIDS, Tuberculosis and Malaria.

<sup>3</sup> Includes NIH Roadmap.

### NIAID Mission Areas: FY 2002 – FY2008

#### Funding



## NIAID Funding by Budget Mechanism

### NIAID Funding by Budget Mechanism: FY 2007 and FY 2008

Dollars in Thousands

	FY 2007	% of Total	FY 2008	% of Total
<b>Extramural Research Activities</b>				
Research Project Grants (RPGs)				
Noncompeting	\$ 1,741,237		\$ 1,844,475	
Competing	503,873		438,740	
Subtotal RPGs	\$ 2,245,110		\$ 2,283,215	
SBIR/STTR <sup>1</sup>	100,351		101,310	
<b>Total Funding for RPGs</b>	<b>\$ 2,345,461</b>	<b>53.8%</b>	<b>\$ 2,384,525</b>	<b>52.1%</b>
Research Centers	132,508	3.0%	128,336	2.8%
Other Research	50,077	1.1%	48,384	1.1%
Training	55,640	1.3%	54,918	1.2%
R&D Contracts <sup>2</sup>	1,005,328	23.0%	1,211,060	26.4%
<b>Subtotal Extramural</b>	<b>\$ 3,589,014</b>	<b>82.2%</b>	<b>\$ 3,827,223</b>	<b>83.6%</b>
Intramural	542,403	12.4%	528,920	11.5%
Research Management and Support (RMS)	217,517	5.0%	225,067	4.9%
Construction	14,100	0.3%	—	0.0%
<b>NIAID Total</b>	<b>\$ 4,363,034<sup>3</sup></b>	<b>100.0%</b>	<b>\$ 4,581,210<sup>4</sup></b>	<b>100.0%</b>

Reflects actual obligations

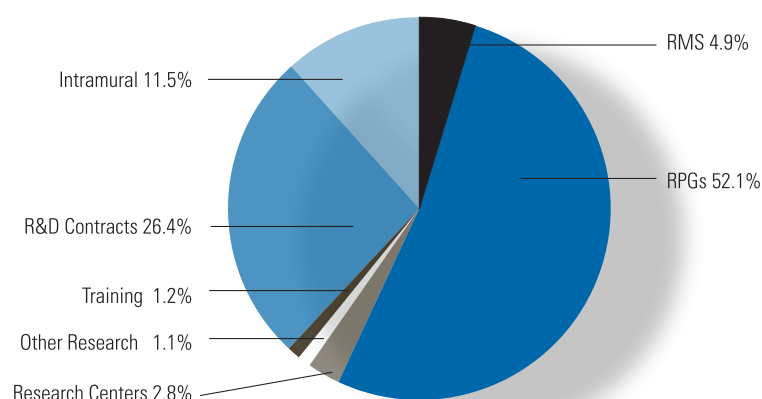
<sup>1</sup> SBIR/STTR programs are congressionally mandated.

<sup>2</sup> Includes Global Fund to Fight AIDS, Tuberculosis and Malaria.

<sup>3</sup> \$54 million was permanently transferred by Congress from NIAID's baseline in FY 2007. Of the \$54 million, \$49.5 million was allocated to the new *Biomedical Advanced Research and Development Authority* initiative to support advanced development activities in biodefense. The remaining \$4.5 million went to support NIH taps.

<sup>4</sup> \$2.1 million was transferred to the *Genes, Environment and Health Initiative* in FY 2008.

### NIAID Funding by Budget Mechanism: FY 2008





## NIAID Research Project Grants: FY 2007 and FY 2008

Research Project Grants (RPGs) are awards made for investigator-initiated research proposals and/or in response to a funding or program announcement. Several types of awards are made in this category, including those in the R (single grant), P (multiproject grant), and U (cooperative agreements) series. RPGs are awarded to organizations of all types, including universities, colleges, and small businesses, for-profit, foreign, and domestic. [For more information on RPGs, visit <http://grants.nih.gov/grants/funding/r01.htm>.](http://grants.nih.gov/grants/funding/r01.htm)

### Dollars in Thousands

		FY 2007 Number of Awards	FY 2007 Amount	FY 2008 Number of Awards	FY 2008 Amount
<b>Research Project Grants</b>					
Noncompeting		3,073	\$ 1,741,237	3,031	\$ 1,844,475
Competing Grants		1,127	503,873	1,090	438,740
<b>Subtotal RPGs</b>		<b>4,200</b>	<b>\$ 2,245,110</b>	<b>4,121</b>	<b>\$ 2,283,215</b>
SBIR/STTRs <sup>1</sup>		222	100,351	256	101,310
<b>Total Funding for RPGs</b>		<b>4,422</b>	<b>\$ 2,345,461</b>	<b>4,377</b>	<b>\$ 2,384,525</b>
<b>For Competing Grants</b>					
Grants within Paylines:					
Traditional R01		436	\$ 169,280	455	\$ 179,360
Non-R01		360	87,718	254	58,460
Program Projects (P01)		8	12,394	10	18,242
<b>Subtotal, Grants within Paylines</b>		<b>804</b>	<b>\$ 269,392</b>	<b>719</b>	<b>\$ 256,062</b>
RFA Grants		219	193,323	150	95,352
Discretionary <sup>2</sup>		104	41,158	221	87,326
<b>Total, Competing Grants</b>		<b>1,127</b>	<b>\$ 503,873</b>	<b>1,090</b>	<b>\$ 438,740</b>
Success Rate		23.0%		22.8%	
Percentile for R01 Grants		12.0		12.0	
Percentile for New Investigators		14.0		14.0	
Average Cost—Competing RPGs			\$ 447	\$ 403	
Adjusted Average Cost—Competing RPGs <sup>3</sup>			\$ 371	\$ 400	

<sup>1</sup> The SBIR/STTR programs are congressionally mandated.

<sup>2</sup> Discretionary: administrative supplements, bridge pool, Division discretionary pool, end-of-year, Office of Special Populations and Research Training, and selective pay.

<sup>3</sup> The average cost of competing grants has been adjusted to account for large HIV/AIDS Clinical Trials Network awards in FY 2006 and FY 2007. Excluding these large dollar awards allows for the comparison of the average cost of comparable competing RPG awards.

### Breakdown of Total RPG Funds: \$2,384,525

#### RPG Percent of Total

P01 6.5

R01 43.7

R03 0.3

R21 5.2

U01 26.4

U19 7.7

SBIR/STTR 4.4

Other (R15, R34, R56, and UC7) 5.7

## Competing and Noncompeting RPG Awards: FY 1999 – FY 2008

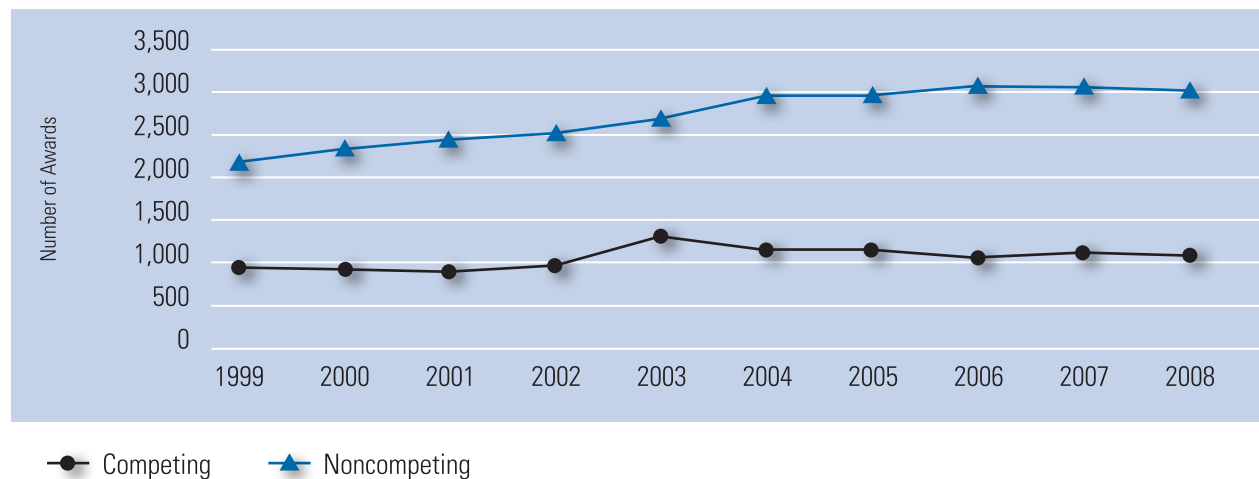
Dollars in Thousands

Fiscal Year	Competing <sup>1</sup>		Noncompeting <sup>2</sup>	
	Number of Awards	Dollars	Number of Awards	Dollars
1999	908	\$ 293,728	2,184	\$ 721,628
2000	896	406,871	2,354	775,572
2001	866	305,736	2,471	1,045,243
2002	978	334,818	2,521	1,114,137
2003	1,278	402,250	2,691	1,286,067
2004	1,161	555,593	2,956	1,486,283
2005	1,164	490,542	2,977	1,608,960
2006	1,049	597,730	3,065	1,578,340
2007	1,127	503,873	3,073	1,741,237
2008	1,090	438,740	3,031	1,844,475

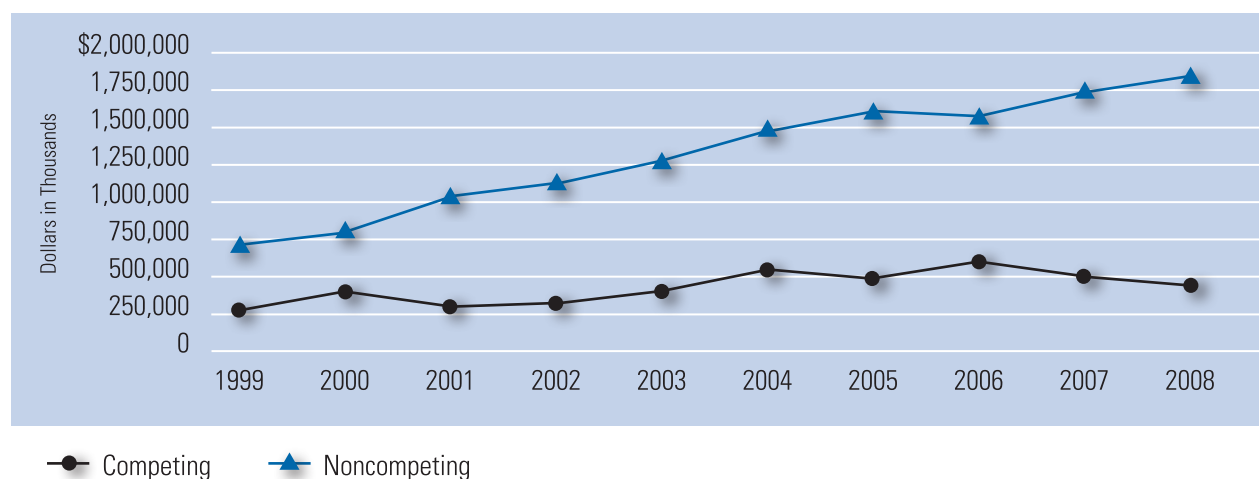
<sup>1</sup> Competing grants include new, renewal, or resubmission applications that must undergo initial peer review before NIH may fund.

<sup>2</sup> Noncompeting grant awards request pay for the next budget increment of a current award; do not compete for available funds.

## Competing and Noncompeting RPG Awards: Number of Awards FY 1999 – FY 2008



## Competing and Noncompeting RPG Awards: Funding FY 1999 – FY 2008



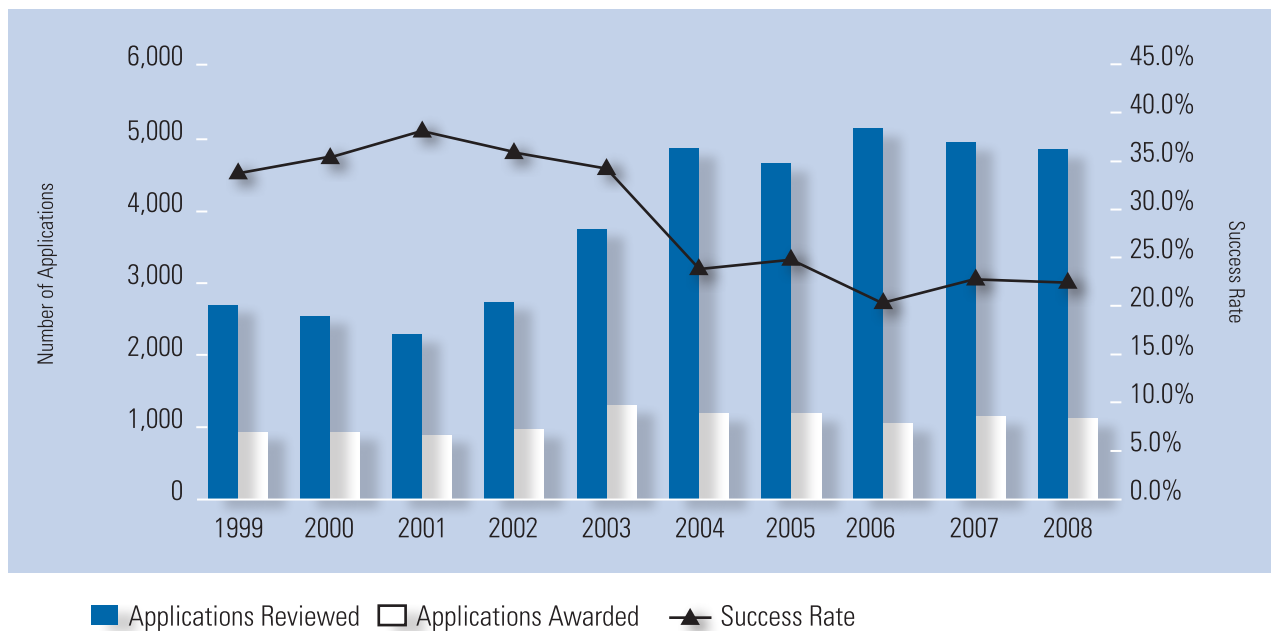
## RPG Application Success Rate

### RPG Application Success Rate: FY 1999 – FY 2008

Fiscal Year	Applications Reviewed	Applications Awarded	Success Rate <sup>1</sup>
1999	2,681	908	33.9%
2000	2,527	896	35.5%
2001	2,262	866	38.3%
2002	2,712	978	36.1%
2003	3,708	1,278	34.5%
2004	4,817	1,161	24.1%
2005	4,611	1,164	25.2%
2006	5,104	1,049	20.6%
2007	4,900	1,127	23.0%
2008	4,776	1,090	22.8%

<sup>1</sup> Success rates are defined as the percentage of reviewed grant applications that receive funding. They are computed on a fiscal year basis and include applications that are peer reviewed and either scored or un-scored by an Initial Review Group. For more information, visit [http://report.nih.gov/success\\_rates/index.aspx](http://report.nih.gov/success_rates/index.aspx).

### RPG Application Success Rate: FY 1999 – FY 2008



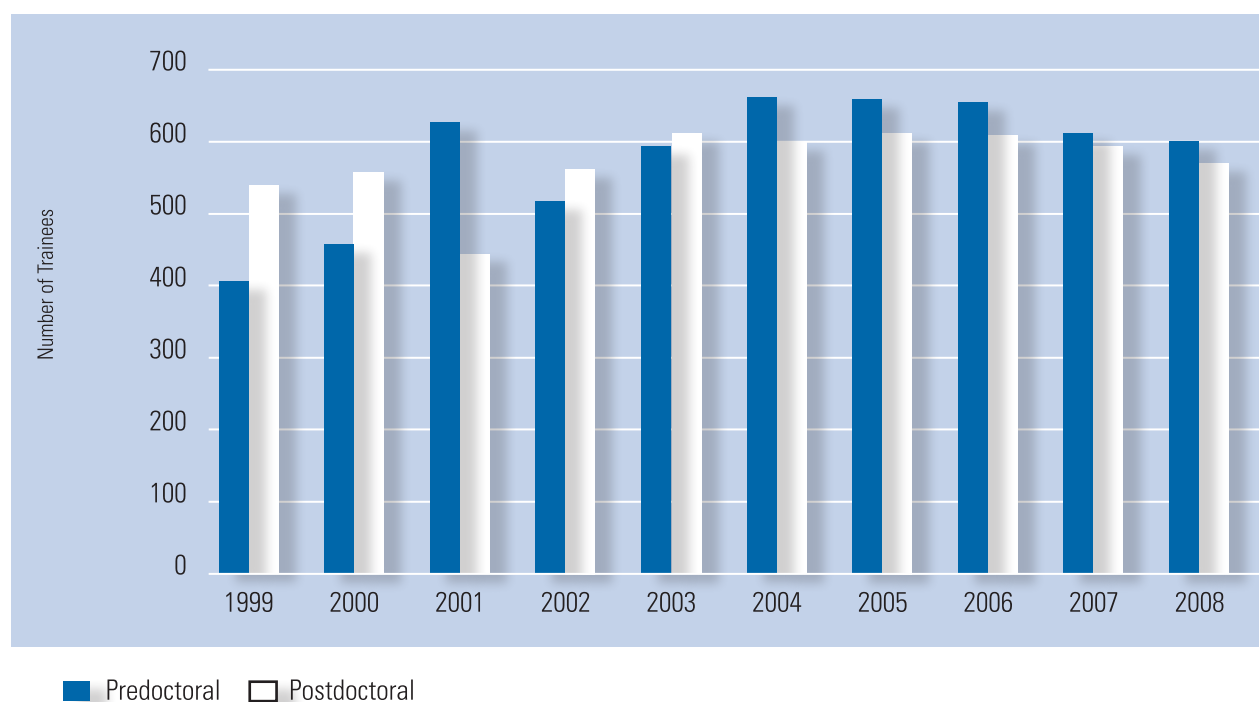
## NIAID-Supported National Research Service Awards

### NIAID-Supported National Research Service Awards: FY 1999 – FY 2008

The Ruth L. Kirschstein National Research Service Award (NRSA) is the primary mechanism for providing long-term, stable support for a wide range of promising scientists and research clinicians.

Trainees	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Predoctoral	404	453	626	513	590	660	655	652	609	598
Postdoctoral	539	560	443	559	610	600	610	607	593	571
<b>Total</b>	<b>943</b>	<b>1,013</b>	<b>1,069</b>	<b>1,072</b>	<b>1,200</b>	<b>1,260</b>	<b>1,265</b>	<b>1,259</b>	<b>1,202</b>	<b>1,169</b>

### NIAID-Supported National Research Service Awards: FY 1999 – FY 2008



Scientist purifying an HIV protein in NIAID's Laboratory of Immunoregulation.



## NIAID Training and Career Development Awards

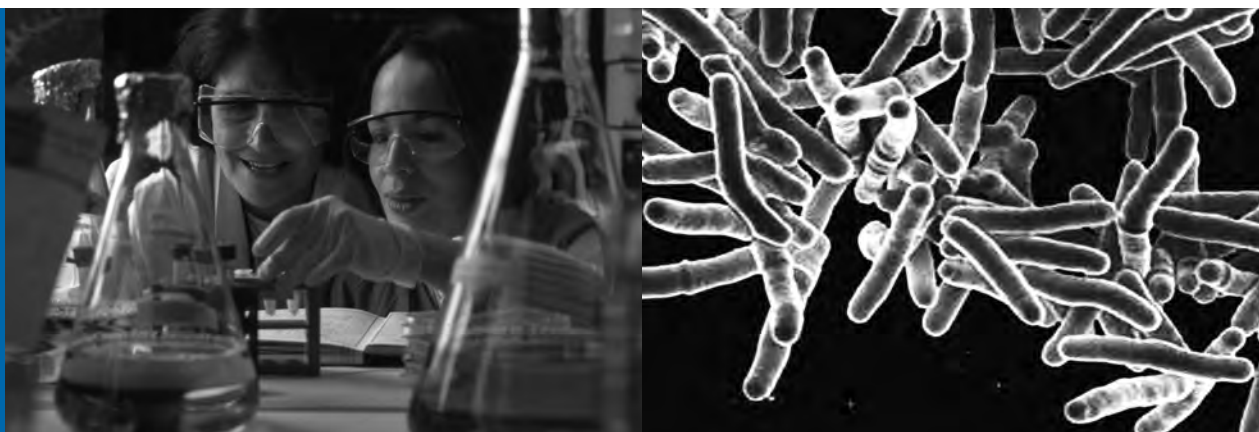
### NIAID Training and Career Development Awards by Mechanism: FY 1999 – FY 2008

NIAID has many opportunities to support scientists through specific training (T), fellowship (F), and career development (K) awards. The number of positions supported by the T, F, and K awards is listed in the table below. There are other mechanisms used to train scientists, including RPGs, for which data are not available.

Dollars in Thousands

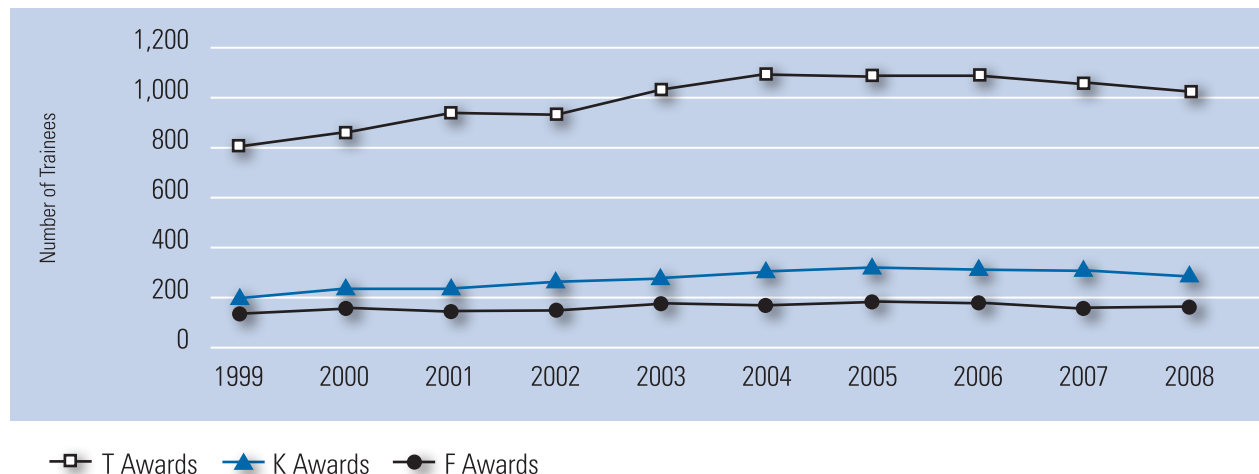
Fiscal Year	T Awards		K Awards		F Awards	
	Number of Awards	Dollars	Number of Awards	Dollars	Number of Awards	Dollars
1999	797	\$ 29,091	204	\$ 17,286	146	\$ 5,178
2000	852	32,035	241	26,863	161	5,709
2001	923	37,113	245	28,885	146	5,266
2002	919	39,474	272	32,237	153	6,162
2003	1,016	46,345	286	33,914	184	7,722
2004	1,087	50,550	314	37,521	173	7,100
2005	1,078	51,136	326	39,903	187	7,913
2006	1,079	48,128	319	39,470	180	7,998
2007	1,043	48,299	314	39,073	159	7,341
2008	1,008	47,523	299	37,388	161	7,395

For additional information on training, career development, and fellowship awards, visit <http://grants.nih.gov/training/extramural.htm>.

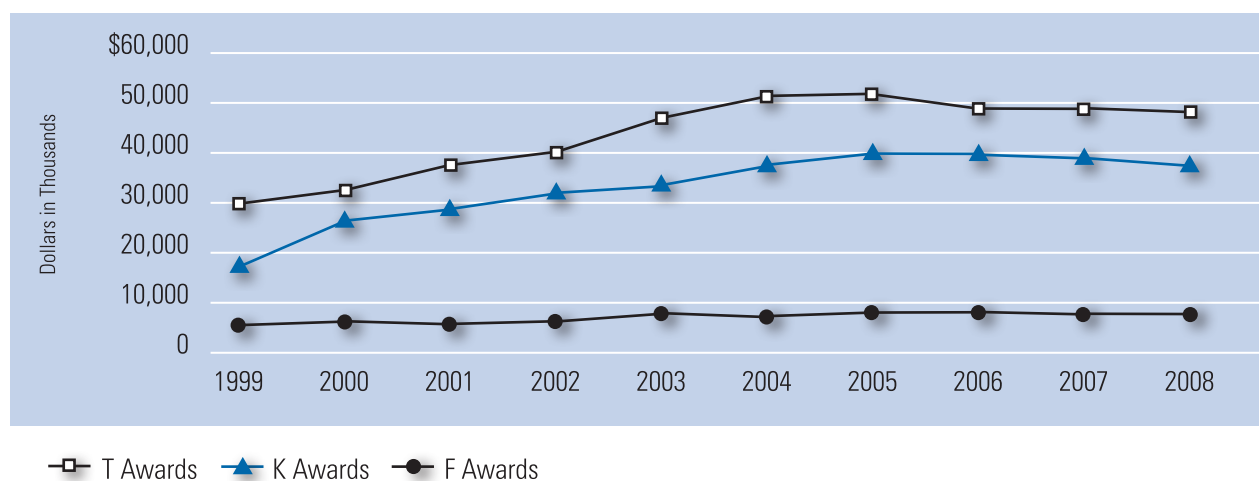




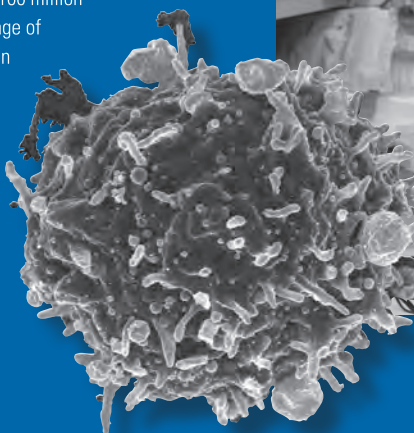
## NIAID Training and Career Development Awards by Mechanism: Number of Trainees FY 1999 – FY 2008



## NIAID Training and Career Development Awards by Mechanism: Funding FY 1999 – FY 2008



(far left) Scientists in NIAID's Laboratory of Infectious Diseases conduct research related to dengue fever, a viral illness spread by mosquitoes that sickens 50 million to 100 million people worldwide each year. (left) Image of *Mycobacterium tuberculosis* cultured in NIAID's Rocky Mountain Laboratories. (right) Electron micrograph image of a CD4+ CD25+ regulatory T cell isolated from a mouse spleen. (far right) Investigators in the NIAID Laboratory of Allergic Diseases examine slide containing mast cells from a patient with mastocytosis.



## NIAID Funding for Selected Pathogens, Diseases, and Conditions

NIAID reports how appropriated funds are spent in different categories and classifications, including by pathogen, specific diseases or condition, and by research area. The table on page 29 represents funding levels for areas of interest to NIAID stakeholders. These areas do not represent the entire NIAID research portfolio. Funding for these areas can overlap and do not add to the total NIAID budget. For example, funding for West Nile virus is represented in several areas, including Vector Borne Diseases, Tropical Medicine, and Infectious Diseases.

The funding amounts listed are derived from two categorization processes. One of the processes—the NIH Research, Condition, and Categorization (RCDC)—was created in response to the requirement in the NIH Reform Act of 2006 (Public Law No. 109-482) that NIH develop a consistent and transparent system to describe how NIH categorizes its research. In FY 2008, NIH began using the RCDC process to report funding levels in 215 research, condition, and disease categories. Prior to the development of the RCDC process, NIAID, like most NIH Institutes and Centers, had its own process for coding and reporting funding levels. Although many of the reporting categories were the same as the 215 RCDC categories, NIAID also coded for many other categories. Areas listed in the table on page 29 with an asterisk report funding levels generated from the RCDC process. Those without an asterisk reflect funding levels generated by the NIAID categorization process; these areas currently are not included in the 215 categories reported through the RCDC process.

### REASONS FUNDING LEVELS MAY DIFFER

#### FY 2008 Funding Amounts

Disease	NIAID	RCDC
Pneumonia and Influenza	\$ 325.4	\$ 241.3
Lupus	28.4	61.0
Tuberculosis	101.4	104.6

The funding amounts that the new RCDC process reports may differ from NIAID reports issued in the past. However, the variation in amounts does not reflect a change in the amount appropriated or spent by NIAID on research in a given disease or research area. These differences reflect the new uniform coding process—RCDC fingerprint—that NIH is using to sort funded research. Reasons for the differences include: 1) RCDC fingerprint categories may be more restrictive or inclusive than NIAID's category definition (e.g., in the case of lupus, the RCDC system incorporates funding for other autoimmune diseases where lupus is mentioned in the abstract); basic research often has a direct impact on many diseases, but may not be included in the RCDC amount; and 3) the RCDC process allocates 100 percent of the project dollars to each of the categories to which the project is assigned. Under the RCDC process, projects that are only slightly related to a category may or may not be captured.

For more information on RCDC, visit <http://rcdc.nih.gov>.

## NIAID Funding for Selected Pathogens, Diseases, and Conditions

### Funding

Dollars in Thousands

Pathogen, Disease, or Condition	Dollars
Allergy	\$ 72,594
Allergic Rhinitis*	2,985
Food Allergy	19,152
Anaphylaxis	4,575
Anthrax*	92,089
Arthritis*	54,166
Asthma*	69,695
Autoimmune Disease*	185,157
Cholera	15,559
Dengue Virus	33,365
Diabetes*	80,294
Diarrheal Diseases	181,453
Digestive Diseases*	238,296
Ebola	50,277
Emerging Infectious Diseases*	1,611,499
Fungal Diseases	48,495
Hepatitis*	63,309
HIV/AIDS	1,497,722
Infectious Diseases, including HIV/AIDS*	2,266,885
Inflammatory Bowel Disease*	16,868

Pathogen, Disease, or Condition	Dollars
Leishmaniasis	\$ 22,862
Lupus*	61,046
Lyme Disease*	17,006
Malaria*	111,386
Multiple Sclerosis*	52,031
Parasitic Diseases	252,279
Pandemic Influenza	185,924
Pediatric (Research)*	254,871
Pediatric AIDS	90,738
Pneumonia and Influenza*	241,259
Primary Immune Deficiency Diseases	21,398
Respiratory Diseases, Infectious	363,410
Sexually Transmitted Diseases / Herpes*	107,087
Smallpox*	70,902
<i>Staphylococcus aureus</i>	18,762
Methicillin-resistant <i>S. aureus</i>	13,064
Tropical Medicine	469,808
Tuberculosis*	104,645
Vector-Borne Diseases*	350,944
West Nile Virus*	37,751

Other Research	Dollars
Antimicrobial Resistance*	\$ 166,740
Biodefense	1,602,353
Antibiotics/Antivirals	325,781
Basic Research	766,838
Chemical Countermeasures Research	48,652
Diagnostic	56,511
Radiological/Nuclear Research <sup>†</sup>	45,700
Vaccines	453,222
Food Safety*	173,552

Other Research	Dollars
Immune Tolerance	\$ 148,165
Prevention*	1,157,085
Stem Cell Research*	52,846
Topical Microbicides*	79,558
Transplantation*	108,178
Vaccine Development	1,248,081
HPV and/or Cervical Cancer Vaccines*	4,649
Vaccine-Related (AIDS)	497,054

\* Represents topics and funding levels reported using the NIH RCDC process.

<sup>†</sup> NIAID coordinates/manages these programs on behalf of NIH.

## NIAID Extramural Research Funding by State

### NIAID Extramural Research Funding by State: FY 2008

Approximately 70 percent of NIAID's total budget supported domestic institutions in the United States, including the District of Columbia and Puerto Rico.

#### Dollars in Thousands

State	Dollars	State	Dollars
Alabama	\$ 54,527	Montana	\$ 8,306
Arizona	15,048	Nebraska	5,041
Arkansas	3,404	Nevada	1,838
California	491,001	New Hampshire	8,405
Colorado	53,890	New Jersey	21,166
Connecticut	44,101	New Mexico	33,711
Delaware	99	New York	241,669
District of Columbia	56,112	North Carolina	170,195
Florida	29,910	North Dakota	68
Georgia	74,616	Ohio	70,057
Hawaii	5,813	Oklahoma	15,423
Idaho	644	Oregon	27,139
Illinois	80,978	Pennsylvania	164,251
Indiana	19,470	Puerto Rico	2,909
Iowa	26,101	Rhode Island	5,981
Kansas	5,405	South Carolina	5,248
Kentucky	7,660	South Dakota	1,093
Louisiana	12,462	Tennessee	55,487
Maine	461	Texas	139,909
Maryland	431,795	Utah	10,817
Massachusetts	327,056	Vermont	3,166
Michigan	33,068	Virginia	67,732
Minnesota	76,074	Washington	208,352
Mississippi	797	Wisconsin	54,408
Missouri	53,199	Wyoming	346
TOTAL \$ 3,226,408			

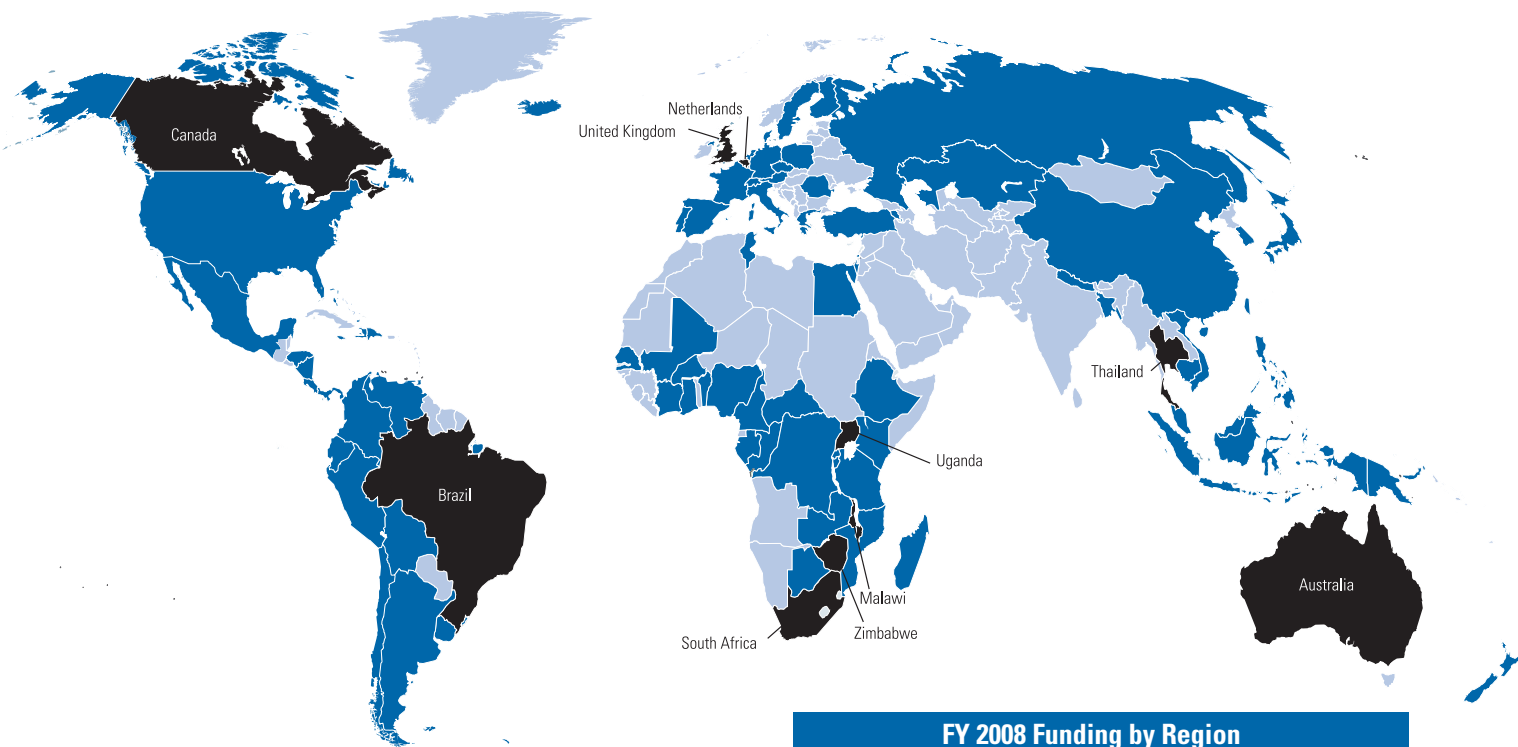
NIAID International Research Funding

NIAID coordinates and supports collaborative, international research programs, focusing upon selected infectious diseases of substantial health importance in developing countries.

In FY 2008, NIAID:

- Supported 683 international projects totaling approximately \$418 million, with 62 percent of funding invested in international HIV/AIDS research.
- Funded international research activities in 90 countries. The 10 foreign countries receiving the largest level of NIAID support include (in alphabetical order) Australia, Brazil, Canada, Malawi, Netherlands, South Africa, Thailand, Uganda, United Kingdom, and Zimbabwe.
- Supported the work of over 400 foreign scientists to train or work in the United States as part of the NIH Visiting Program.
- Posted full-time staff in China, India, Mali, Nigeria, South Africa, and Uganda.

For more information on NIAID’s role in global research, visit <http://www.niaid.nih.gov/topics/globalresearch> or <http://www3.niaid.nih.gov/about/organization/odoffices/omo/ogr/default.htm>.



- Countries with NIAID-funded activities (90 countries)
- Top 10 foreign countries receiving NIAID research support

FY 2008 Funding by Region	
Region	
Africa	39.1%
Europe /Eurasia	24.2%
East Asia Pacific	18.1%
Western Hemisphere*	15.4%
South/Central Asia Region	2.8%
Near East	0.4%
Total Funding by Region	100.0%

\* Excluding the United States



## NIAID Technology Transfer and Partnerships

Technology transfer in federal laboratories facilitates the dissemination of new technologies and research materials developed by U.S. government scientists. This fuels further innovation and commercialization by the extramural research and development community, ultimately resulting in improved public health and an increase in the competitiveness of U.S. industries. Federal legislation mandates and defines technology transfer activities of the U.S. government.

NIAID's Office of Technology Development (OTD) facilitates the transfer of significant research advances and resources to the broader scientific community and develops collaborative relationships among NIAID scientists, industry, and academia. The Institute uses various mechanisms to accomplish these ends, including, but not limited to, Cooperative Research and Development Agreements (CRADAs), Materials CRADAs (MCRADAs), Research Collaboration Agreements (RCAs), and Conditional Gift Acceptance Letters. In FY 2008, NIAID initiated 8 new CRADAs, 5 new MCRADAs, and 28 new RCAs. In addition to these mechanisms, NIAID uses other approaches for collaboration and partnerships, including grants, SBIR awards, and contracts and partnerships established with and through the Foundation for the National Institutes of Health.

For more information on the NIAID Office of Technology Development, visit <http://www3.niaid.nih.gov/about/organization/odoffices/omo/otd>.

NIAID coordinated the successful transfer and licensure of a human mast cell line to nonprofit, biotechnology and academic institutions, resulting in awards and publications in peer-reviewed scientific journals.

## NIAID Technology Transfer Activities<sup>1</sup>

Fiscal Year	Total Number of U.S. Patents Issued	Licenses in Effect	Active CRADAs
1999	148	145	74
2000	161	138	86
2001	174	147	93
2002	187	157	85
2003	189	153	71
2004	203	142	70
2005	207	159	76
2006	214	154	73
2007	227	148	60
2008	235	149	58

<sup>1</sup> Table displays activities resulting from NIAID Intramural research.



Visiting staff fellow wearing Bio Safety Level (BSL) 3 gear demonstrates preparation of tissue culture plates infected with West Nile virus and dengue virus.

# National Advisory Allergy and Infectious Diseases Council

The National Advisory Allergy and Infectious Diseases Council represents a diverse perspective on science, health, and the human impact of disease. Its 18 voting members include 12 health or science experts and 6 lay members. Members usually serve four-year terms. Six nonvoting *ex officio* members provide liaison with higher-level federal agencies having missions consistent with that of NIAID. The Council plays four key roles: performing second-level review of grants, advising the Institute on policy, reviewing programs, and developing and clearing research concepts for funding opportunity announcements.

**Chair:** Anthony S. Fauci, M.D., Director, NIAID

**Executive Secretary:** Marvin Kalt, Ph.D., Director, Division of Extramural Activities, NIAID

## FY 2008 Advisory Council Members:

Ann M. Arvin, M.D. (2011)*	Stanford University School of Medicine
Barbara A. Baird, Ph.D. (2009)	Cornell University
Robert G. Brooks, M.B.A., M.D. (2010)	Florida State University College of Medicine
Carol A. Carter, Ph.D. (2011)	State University of New York at Stony Brook
Satya Dandekar, Ph.D. (2010)	University of California, Davis
Kathryn M. Edwards, M.D. (2009)	Vanderbilt University Medical School
Richard A. Insel, M.D. (2008)	Juvenile Diabetes Research Foundation International
Sharon C. Kiely, M.D., M.P.M., (2010)	Allegheny General Hospital Department of Medicine
Martin G. Myers, M.D. (2008)	University of Texas Medical Branch
Shelley M. Payne, Ph.D. (2008)	University of Texas, Austin
Louis J. Picker, M.D. (2011)	Oregon Health Sciences University
N. Regina Rabinovich, M.D., M.P.H. (2011)	Bill and Melinda Gates Foundation
Martin Rosenberg, Ph.D. (2009)	Promega Corporation
Marc E. Rothenberg, M.D., Ph.D. (2010)	University of Cincinnati College of Medicine
Gary K. Schoolnik, M.D. (2008)	Stanford University Medical Center
Megan T. Sykes, M.D. (2009)	Massachusetts General Hospital
Christel Uittenbogaart, M.D. (2011)	Indiana University
David S. Wilkes, M.D. (2010)	Indiana University School of Medicine

## Ex Officio Members:

Mitchell L. Cohen, M.D.	Centers for Disease Control and Prevention
Michael O. Leavitt	Department of Health and Human Services
LTG Eric B. Schoomaker, M.D., Ph.D.	U.S. Army Medical Department
Ronald O. Valdiserri, M.P.H., M.D.	Department of Veterans Affairs
George W. Weightman, M.D., Major General	U.S. Army Medical Research and Materiel Command
Elias A. Zerhouni, M.D.	National Institutes of Health

\*Represents the end of the Advisory Council member's term.

For more information on the National Advisory Allergy and Infectious Diseases Council and other advisory committees, visit <http://www3.niaid.nih.gov/about/whoWeAre/councilcommittees>.

# Glossary

<b>AIDS</b>	Acquired Immunodeficiency Syndrome
<b>BioD</b>	Biodefense and Emerging Infectious Diseases
<b>CRADA</b>	Cooperative Research and Development Agreement
<b>F31</b>	NRSA for Individual Predoctoral Fellowship to Promote Diversity in Health-related Research
<b>F32</b>	Postdoctoral Individual NRSA
<b>F33</b>	NRSA for Senior Fellows
<b>F34</b>	Minority Access to Research Careers (MARC) Faculty Predoctoral Fellowship
<b>FY</b>	Fiscal Year
<b>HIV</b>	Human Immunodeficiency Virus
<b>IID</b>	Infectious and Immunologic Diseases
<b>K01</b>	Research Scientist Development Award
<b>K02</b>	Independent Scientist Award
<b>K06</b>	Research Career Award
<b>K08</b>	Clinical Investigator Award
<b>K22</b>	Research Scholar Development Award
<b>K24</b>	Mid-Career Investigator Award in Patient-Oriented Research Award
<b>K25</b>	Mentored Quantitative Research Career Development Award
<b>MCRADA</b>	Materials Cooperative Research and Development Agreement
<b>MRSA</b>	Methicillin-resistant <i>Staphylococcus aureus</i>
<b>NAAID Council</b>	National Advisory Allergy and Infectious Diseases Council
<b>NIAID</b>	National Institute of Allergy and Infectious Diseases
<b>NIH Roadmap</b>	NIH Roadmap for Medical Research
<b>NRSA</b>	National Research Service Award
<b>P01</b>	Program Project Award
<b>R01</b>	Research Project (Traditional) Award
<b>R03</b>	NIH Small Grant Program
<b>R15</b>	Academic Research Enhancement Awards (AREA)
<b>R21</b>	Exploratory/Developmental Research Grant Award
<b>R34</b>	Clinical Trial Planning Grant
<b>R37</b>	Method to Extend Research in Time (MERIT) Award
<b>RCDC</b>	Research, Condition, and Disease Categorization
<b>UC7</b>	NIH Challenge Grants and Partnerships Program—Phase II— Cooperative Agreement
<b>R56</b>	Bridge Award
<b>RCA</b>	Research Collaboration Agreement
<b>RMS</b>	Research Management and Support
<b>RPG</b>	Research Project Grant
<b>SBIR/STTR</b>	Small Business Innovation Research/Small Business Technology Transfer Research Award
<b>T32</b>	Institutional NRSA
<b>T35</b>	NRSA Short-Term Research Training
<b>T36</b>	Minority Access to Research Centers (MARC) Ancillary Training Center

For additional information on the NIAID Glossary of Funding and Policy Terms and Acronyms, visit <http://www.niaid.nih.gov/ncn/glossary/default.htm>.







# Online Resources

NIAID Home	<a href="http://www.niaid.nih.gov">http://www.niaid.nih.gov</a>
Organizational Structure	<a href="http://www3.niaid.nih.gov/about/organization/org_charts">http://www3.niaid.nih.gov/about/organization/org_charts</a>
Strategic Plans/Research Agendas	<a href="http://www3.niaid.nih.gov/about/whoWeAre/planningpriorities">http://www3.niaid.nih.gov/about/whoWeAre/planningpriorities</a>
Budget Office	<a href="http://www3/niaid.nih.gov/about/whoWeAre/budget/default.htm">http://www3/niaid.nih.gov/about/whoWeAre/budget/default.htm</a>
Financial Management Plan	<a href="http://www.niaid.nih.gov/ncn/sop/fmp.htm">http://www.niaid.nih.gov/ncn/sop/fmp.htm</a>
Office of Global Research	<a href="http://www3.niaid.nih.gov/about/organization/odoffices/omo/ogr">http://www3.niaid.nih.gov/about/organization/odoffices/omo/ogr</a>
NIAID Role in Global Research	<a href="http://www.niaid.nih.gov/topics/globalresearch">http://www.niaid.nih.gov/topics/globalresearch</a>
Office of Technology Development	<a href="http://www3.niaid.nih.gov/about/organization/odoffices/omo/otd">http://www3.niaid.nih.gov/about/organization/odoffices/omo/otd</a>
NIAID Committees	<a href="http://www3.niaid.nih.gov/about/whoWeAre/councilCommittees">http://www3.niaid.nih.gov/about/whoWeAre/councilCommittees</a>
Advisory Council	<a href="http://www.niaid.nih.gov/ncn/budget/default_council.htm">http://www.niaid.nih.gov/ncn/budget/default_council.htm</a>
NIAID Directory	<a href="http://www3.niaid.nih.gov/about/findingpeople">http://www3.niaid.nih.gov/about/findingpeople</a>
NIAID Glossary	<a href="http://www.niaid.nih.gov/ncn/glossary/default.htm">http://www.niaid.nih.gov/ncn/glossary/default.htm</a>
NIH Home	<a href="http://www.nih.gov">http://www.nih.gov</a>
Grants.gov	<a href="http://www.grants.gov">http://www.grants.gov</a>
NIH Extramural Training	<a href="http://grants.nih.gov/training/extramural.htm">http://grants.nih.gov/training/extramural.htm</a>
RCDC	<a href="http://rcdc.nih.gov">http://rcdc.nih.gov</a>

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